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INTERMOUNTAIN FOREST & RANGE EXPERIMENT STATION
REED W. BAILEY, DIRECTOR

FOREST SERVICE
U. S. DEPARTMENT OF AGRICULTURE
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By

Division of Forest Insect Research

INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
Forest Service
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Ogden, Utah
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The annual forest insect survey in the Intermountain and northern Rocky Mountain States during 1957 was aided greatly by cooperation of personnel in other Federal and State land-managing agencies, forest industries, and interested private land owners. Entomologists of the Intermountain Forest Experiment Station collected and coordinated forest insect information within the area.

Aerial observation of forested areas again proved indispensable in the detection phases of the surveys. Ground surveys were performed where reports or aerial observations indicated a need for further examination. While it was impossible to survey all forested areas during 1957, improved coverage was possible through cooperative effort, and it is doubtful that any serious infestations escaped detection.

Numerous forest insect situations in the area covered by these surveys are serious or potentially serious. Defoliators of various kinds seem to be more common than for several years. The larch casebearer, a European species that has been known in the East for many years, now has been found in western larch. Damage from bark beetles still occurs at levels that require control action. The highlights of the 1957 surveys are presented.

BARK BEETLES

Damage from bark beetles is not extremely heavy in the northern Rocky Mountain States. The serious outbreak of Engelmann spruce beetle of the past few years in Montana and northern Idaho is now a problem of "hot spot" infestations in a few areas. In other parts of the station territory some outbreaks that have required control efforts during the past few years are still active. A tendency toward increasing activity of mountain pine beetle reported last year was again noted.

DOUGLAS-FIR BEETLE

Dendroctonus pseudotsugae Hopk.

The Douglas-fir beetle is at a low level in most areas, judging by aerial and ground surveys. The aerial surveys being based on faders reveal loss from attack the previous year. Ground surveys plus observations during research studies confirm the downward trend.

A few areas are exceptions. In the Yellowstone River canyon in Yellowstone National Park approximately 25 percent of the mature overstory trees on 1,000 acres has been killed by the beetle during the past 3 years. These trees had been heavily defoliated by the spruce budworm from 1953 through 1955.

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A few areas of activity were noted on the Boise and Sawtooth National Forests in Idaho. In western Wyoming, eastern Idaho, and Utah the beetle has continued to show a downward trend except on the Dixie National Forest and adjoining land where heavy damage continues. The fir type occurs in patches and practically all stands are heavily infested. On many pockets 300 acres or larger, almost total kill has occurred.

ENGELMANN SPRUCE BEETLE

Dendroctonus engelmanni Hopk.

Remnants of the extensive epidemic of 1952-1956 in Montana and northern Idaho persist in some stands of pure spruce where logging is being conducted for control purposes. In most areas where stands composed of pure mature spruce have been logged for beetle control, infestation has died out. Continued logging reduces the severity of the outbreaks but "hot spot" centers have been noted, apparently maintained by chunks, cull logs, and tops shaded by residual trees. Also blowdown trees adjoining cutting areas contribute to the infestation. Continued effort in these areas will be required to prevent increased damage.

The outbreak of Engelmann spruce beetle on the Bridger National Forest in Wyoming discovered in 1955 is still aggressive. The program of logging and use of trap trees continues. Surveys this season revealed approximately 37,000 infested trees and stumps on 24,000 gross acres. As much as 33 percent of the spruce has been killed in parts of the infestation. The infestation has not spread to adjacent spruce areas.

BLACK HILLS BEETLE

Dendroctonus ponderosae Hopk.

The present outbreak of Black Hills beetle on the Dixie National Forest and Bryce Canyon National Park is now in its eighth year. By a combination of logging and chemical treatment, populations have been reduced in control areas. Unfortunately, conditions are such that epidemic centers continue to develop in new areas. This year for the first time a large stand of virgin ponderosa pine on the Escalante side of the forest shows "red tops" that indicate that epidemic conditions may be encountered.

The ponderosa forests in the area suffered from deficient rainfall for the 7 years prior to 1957. This year rainfall was well distributed throughout the season and in amounts that should break the drought condition. Early winter snows have been encouraging. It has been assumed that deficient rainfall has contributed to stand susceptibility. It is hoped that the increased rainfall will increase the stand vigor and help to stop this epidemic.

MOUNTAIN PINE BEETLE

Dendroctonus monticolae Hopk.

The Intermountain and northern Rocky Mountain States have extensive lodgepole stands that favor development of epidemics of mountain pine beetle. During 1956 the surveys showed a tendency toward a buildup of populations in parts of Utah, southern Idaho, and western Wyoming. The 1957 surveys substantiated the observation.

The greatest concentration of infested trees is on the Wasatch National Forest; it continues an infestation that has been present at fluctuating levels for the last 17 years. The adjoining Ashley National Forest contains several epidemic centers.

In the Grand Teton National Park and the adjoining Teton National Forest numerous centers of infestation were found. Several centers were treated chemically during 1956 but additional areas appeared this year. Two small infested areas were found on private land near the upper end of the Targhee National Forest.

Lodgepole pine killed by mountain pine beetle

The mountain pine beetle in lodgepole pine in the northern Rocky Mountain areas continues at relatively low level. Two small infestation centers are known in northern Idaho and one in Glacier National Park. Losses in western white pine on the Clearwater National Forest, while slightly higher than during 1956, are considered normal.

The mountain pine beetle is also active in a second-growth stand of ponderosa pine in the Crystal Bay area of Lake Tahoe, Nevada. This outbreak threatens highly valued recreational private land including summer home sites. A recent survey indicates that this infestation is continuing at about the same level as last year. The cumulative loss since 1950 is considerable.

The present situation indicates that special attention must be given to lodgepole stands in view of the epidemic tendencies noted.

WESTERN PINE BEETLE

Dendroctonus brevicomis Lec.

Activity of western pine beetle in ponderosa pine stands of the Intermountain station territory remains at a low level. Infested trees can be found in most pine stands but are widely scattered.

SOUTHWESTERN PINE BEETLE

Dendroctonus barberi Hopk.

The southwestern pine beetle continues to kill ponderosa pine on the heavily used recreational areas of Charleston Mountain near Las Vegas, Nevada. Constant maintenance type of control throughout the active season has been in progress for several years.

DEFOLIATORS

For the past few years the area has been plagued by outbreaks of various kinds of defoliators. This year was no exception and even produced a new record for the West with the discovery of an infestation of larch casebearer.

SPRUCE BUDWORM

Choristoneura fumiferana (Clem.)

The spruce budworm has been a serious pest in Montana and northern Idaho for nearly 10 years. Spray projects since 1953 have treated more than 2 million acres.

The 1957 aerial and ground surveys show approximately 2,846,000 acres of Douglas-fir still infested, 90 percent of which is in Montana with the remainder in one area in northern Idaho. Infestations in some areas were less intense, others at the same level, and of course some showed heavier defoliation than during 1956. Infestations that have been severe for the past few years are causing considerable damage, and in many areas the younger understory trees have been killed.

In southern Idaho spruce budworm infestations became quite noticeable and severe during 1952. Since 1955 slightly more than 2 million acres of fir have been sprayed. Aerial and ground surveys during 1957 revealed about 512,300 acres of infestation on five national forests. Much of this acreage consists of defoliation that has been noticeable for only 1 or 2 years. The rate of increase in defoliation is particularly rapid on the Salmon National Forest.

For the first time since aerial spraying of budworm started in the West, damaging populations of mites developed in some areas sprayed in 1956. More detail is presented in the section on mites.

BLACK-HEADED BUDWORM

Acleris variana (Fern.)

High endemic populations of the black-headed budworm are reported throughout many Douglas-fir stands in Montana in conjunction with spruce budworm populations. This is particularly noticeable east of the Continental Divide. Epidemic populations of black-headed budworm caused heavy defoliation in western hemlock stands in scattered locations in the Kootenai National Forest and in Glacier National Park in Montana and in the Kaniksu in Idaho. Aerial surveys showed that these scattered infestations total approximately 32,000 acres on which hemlock damage is readily visible. Ground surveys have also recorded active infestations in grand fir stands in the Pend Oreille River drainages near Newport, Washington. Damage, however, is hardly visible. Additional ground surveys in hemlock stands indicate that although damage was heavy in 1957, overwintering budworm populations are light. Some areas showed a drastic reduction in larval population prior to pupation. Additional surveys of this nature are being made. It is believed that the trend of this infestation is toward endemic conditions. The black-headed budworm also occurs with spruce budworm in southern Idaho.

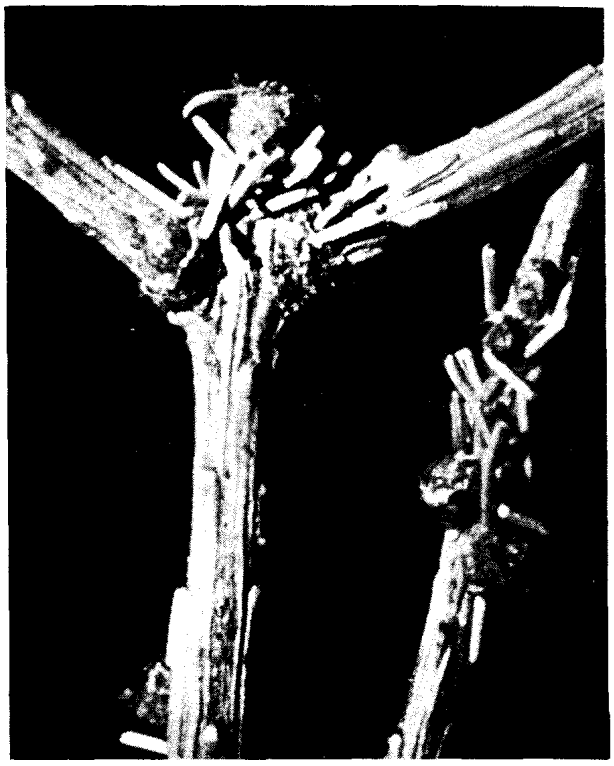
LARCH INSECTS

In 1955 and 1956 considerable defoliation of western larch in Montana and northern Idaho was reported. It was known that several species were involved in the infestations. Surveys and observations during 1957 have helped to clarify the situation.

At the higher elevations it appears that the budmoth, Zeiraphera griseana (Hubner), is most common. Examination of felled trees revealed that the budmoth caused a reduction in leaf surface of at least 50 percent in 1957.

A larch looper, Semiothisa sexmaculata (Pack.), also was found to be a widespread defoliator, but there are no records of its presence prior to 1955. It was found in every larch stand examined but at lower elevations than stands infested by budmoth. Looper populations were relatively light and the injury was negligible.

Populations of the two-lined larch sawfly, Anoplonyx occidens Ross, and occasionally the western larch sawfly, A. laricivorus Roh. and Midd., have been observed with populations of the larch looper throughout the range of western larch in Montana and northern Idaho. Damage by the sawflies appears slight.



Hibernating larch casebearers

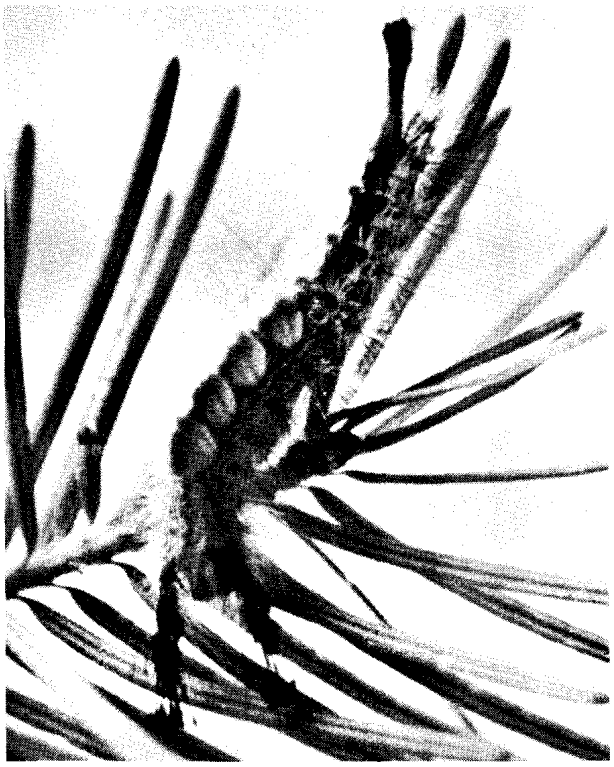
The larch casebearer, Coleophora laricella (Hbn.), a European insect widely distributed in the Eastern United States,was first noted in northern Idaho in 1957. No doubt it had been present for some time before its discovery. An infestation of approximately 15,000 acres near St. Maries was reported in young larch stands. The feeding produced severe defoliation on the infested trees, and a heavy population is now hibernating on twigs. When an introduced insect appears in a new area there is concern over its behavior and damage under new environmental conditions. Intensified surveys should be made to determine the full extent of its distribution.

DOUGLAS-FIR TUSSOCK MOTH

Hemerocampa pseudotsugata McD.

During 1951 the Douglas-fir tussock moth reached outbreak proportions in Owyhee County in Idaho. At that time about 10,000 acres of second-growth Douglas-fir were heavily infested. The following year the outbreak subsided, with limited tree mortality and some top killing. The fir is growing on an excellent site and the prospects are good for future timber production.

In 1956 the insect was again reported active in the same area.Surveys revealed considerable defoliation in parts of the infestation. There was evidence of considerable parasitism. During the present season defoliation again occurred ranging from light to heavy. In areas classified as heavy the greatest defoliation occurred in the upper crowns, and top-killing could result where tops were denuded. A gross area of 26,000 acres was mapped from the air. Unless control is attempted or biological factors operate at higher level, this infestation could produce considerable damage to the stand next year.



Douglas-fir tussock moth larva

Within the Owyhee area a confounding situation on alpine fir was encountered. Heavy defoliation was noted, but the insect causing it has not been identified. The type of damage present on the alpine fir with the absence of pupal cases has some characteristics of sawfly damage. (See alpine fir defoliator.)

ALPINE FIR DEFOLIATOR

For the second year heavy defoliation of alpine fir has occurred in Idaho in areas sprayed for budworm control the previous year. This year it was found outside sprayed areas. Approximately 153,000 acres are affected, 103,700 of which are on the Boise National Forest. Since the survey was based on damage, the insect was not available for collection and identification at the time survey crews were in the area. However, a few collections of insects made during research studies may include the defoliator but contents of the samples have not yet been identified.

FIR NEEDLE MINER

Epinotia meritana Hein.

White fir defoliated
by needle miner

The outbreak of fir needle miner in the Bryce Canyon National Park area in southern Utah is now reduced to endemic level. Partially responsible for the decrease was the aerial test spraying of about 4,000 acres with an oil solution of malathion. Parasites also contributed to the over-all reduction of the needle miner population. Infestations on adjoining Dixie National Forest land also show a significant downward trend.

Approximately 10,000 acres of white fir were heavily defoliated during the course of this epidemic in the Park and on the Forest. Some tree killing occurred, principally understory trees. The stand is now in a weakened condition and therefore more susceptible to fir engraver beetles, primarily Scolytus ventralis.

DOUGLAS-FIR SAWFLY

Neodiprion abietis complex

Surveys show that sawflies are still active in the Craters of the Moon National Monument in southern Idaho. The infestation is not especially serious, but the limited fir in the area has considerable aesthetic value. Sawflies in Douglas-fir have been observed at endemic levels rather generally throughout southern Idaho.

PINE BUTTERFLY

Neophasia menapia (F. & F.)

Following the control work on the Boise National Forest in Idaho a few years ago, special attention has been given to detection of any pine butterfly infestations. This year several localized infestations were discovered on the Payette, Boise, and Salmon Forests; none of them were of any size or consequence; but they indicate need for continued vigilance.

ENGRAVER BEETLES

ALPINE FIR ENGRAVER

Scolytus and/or Dryocetes

Losses from these beetles in southern Idaho are scattered throughout the fir areas generally at endemic levels. The only heavy concentration of damage is within the Roaring River drainage on the Boise Forest.

Generally in eastern Idaho, western Wyoming, and in Utah the damage caused by the fir engraver beetle (Scolytus ventralis Les.) seems to be decreasing, but many trees are being killed in widely scattered areas throughout the region.

In southern Utah in and near Bryce Canyon National Park fir engraver beetle activity has increased sharply in the white fir stands weakened by the fir needle miner (Epinotia meritana Hein.).

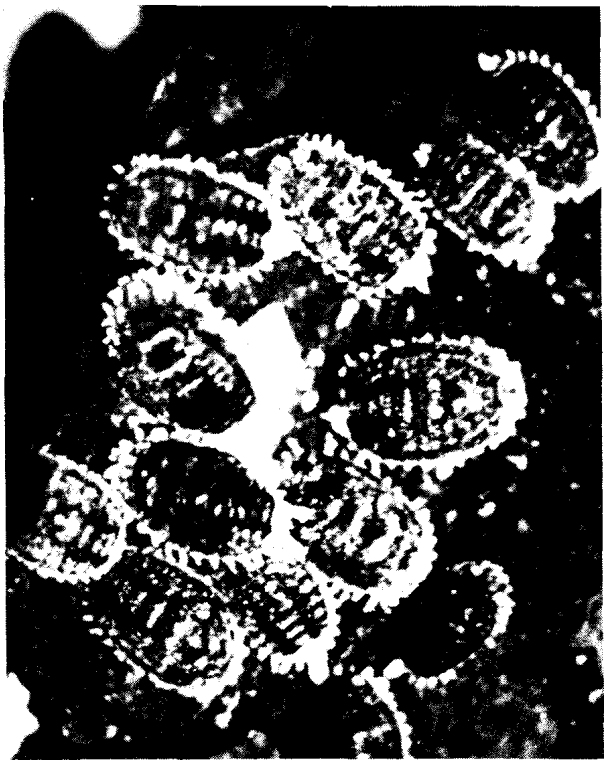
IPS ENGRAVER BEETLES

Losses in ponderosa and western white pine stands from engraver beetles were insignificant in 1957.

Increased activity by Ips confusus (Lec.) in areas in southern Utah and western Nevada have been noted on pinyon pine. In centers of infestation, groups as large as 3,000 trees have been killed.

SPRUCE MEALYBUG

Puto sp.



Hibernating spruce mealybug
(greatly enlarged)

About 60,000 acres of Engelmann spruce in southern Utah in two centers on the Dixie and Fishlake National Forests are heavily infested with a mealybug. From present knowledge it occurs only in this spruce area. The mealybug infests all ages from reproduction to mature trees. Limited studies of the life history and habits are being conducted to develop basic information needed to assess its importance. Considerable damage, in the form of tree deformity and reduced vigor is present in areas where the pest has been active for several years. The extent of tree killing has not been determined but probably occurs only after continued feeding and gradual decline in vigor. No control methods are known.

COOLEY GALL LOUSE

Chermes cooleyi Gill

High endemic infestations of the Cooley gall louse were reported in Douglas-fir Christmas tree stands in the upper Kootenai River and Tobacco River valleys in northwestern Montana. The infestations are associated with severe infections of the Douglas-fir needle blight, Rhabdocline pseudotsugae Syd. Dr. Waters of Montana State University visited the stands with entomologists and confirmed the presence and severity of the needle blight.

SCALE INSECTS

Small localized infestations of the black pine leaf scale, Nuculaspis californica (Coleman), and the pine leaf scale, Phenocaspis pinifoliae (Fitch), were reported on ponderosa pine trees near Spokane, Washington. These infestations are remnants of epidemic populations that were reduced in 1951 and 1955 by extremely low temperatures. Current damage is insignificant except on a few trees.

MITES

During this year a new situation developed. Spider mite damage, primarily by Oligonychus ununguis (Joc.) appeared in Montana and southern Idaho in fir stands sprayed during 1955 and 1956 to control budworm. A few lesser infestations have been noted outside spray areas, but heavy populations and damage coincide with previously sprayed areas. About 790,000 of 885,000 acres sprayed during 1956 in Montana show damage by mites. In southern Idaho some 22,300 acres have been damaged. Foliage that is heavily fed upon becomes yellowish and foliage and smaller twigs appear desiccated. The twigs in many cases are brittle.

It is believed that spraying in 1955 and 1956 coincided with a natural upsurge in mite populations resulting in greater damage in sprayed areas. There are numerous references in literature to increases of mite populations following use of DDT. Millions of acres have been sprayed since 1949 without mite problems. The life of an upsurge in mite populations in forests is not known but the few records available in western forests in nonsprayed areas indicate that outbreaks are generally short lived.

Entomologists from Canada who have had wide experience with mites visited areas in Montana. Information furnished by these specialists will be of great value in subsequent observations to assess the severity of the mite damage.